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Reply to Office action of November 1, 2006

REMARKS/ARGUMENTS

The Applicant thanks Examiner Rosenburger and Examiner Akanbi for the time and courtesy extended to Applicant's attorneys during the telephone interview of January 23, 2007. During the telephone interview, Applicant's attorneys and the Examiners discussed how independent claim 1 differs from the art of record. Examiner Rosenburger and Examiner Akanbi stated that they now understand Applicant's position on the patentably distinguishable features of the claimed invention and that the Examiners will reconsider the patentability of the claims.

The above identified patent application has been amended and reconsideration and reexamination are hereby requested.

Claims 1-39 are now in the application, of which, Claims 1, 20, and 30 are independent. Claims 1-3, 5-10, 12, 19-20 and 30-32 have been amended herein. Claims 35-39 are new.

The Applicant has amended the Specification to correct minor typographical errors. No new matter has been added.

Claims 1 and 30 Rejected under 35 U.S.C. §101

Claims 1 and 30 were rejected under 35 U.S.C. §101 because the claimed invention is allegedly directed toward non-statutory subject matter. Claim 1 includes the limitation "applying a force in the determined direction to plastically deform said at least one of the optical components to re-align the optical components." In addition, Claim 30 includes the limitation "applying a force to plastically deform said one of the optical components to realign the optical components." Because in both of these claims there is a transformation of a photonic package into a different state, that state being a form in which the optical components of the photonic package are better aligned through a deformation, the Applicant submits that Claims 1 and 30 are patentable subject matter and therefore should not have received a 35 U.S.C. §101 rejection.

Applicant thanks Examiner Isiaka Akanbi and Examiner Richard Rosenburger for an Examiner interview conducted on Thursday, January 18, 2007. In a phone conversation with Examiner Akanbi, Examiner Akanbi agreed that the claims should not have received a rejection under 35 U.S.C. §101. Examiner Akanbi suggested that the Applicant contact Examiner

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Rosenburger as well. In a phone conversation with Examiner Rosenburger, Examiner Rosenburger also agreed that the claims should not have received a rejection under 35 U.S.C. §101.

Thus, The Applicant submits that Claims 1 and 30 include patentable subject matter and therefore the rejection of these claims under 35 U.S.C. §101 should be withdrawn.

Claims 1-19 and 30-34 Rejected Under 35 U.S.C. § 103(a)

Claims 1-19 and 30-34 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Jang et al. (US 6,608,959) in view of Miyokawa et al. (US 2002/0001324).

Independent Claim 1 now includes, among other limitations, (underlining added for emphasis) "... fixing the optical components" and then "after fixing the optical components, determining a direction to plastically deform at least one of the optical components through performing a sweep of force vectors." Independent Claim 30 now includes, among other limitations, (underlining added for emphasis) "... fixing the optical components" and then "determining a direction to plastically deform one of said optical components through performing a sweep of force vectors." In both of these claims, said determining a direction to plastically deform at least one of the optical components through performing a sweep of force vectors occurs after said fixing the optical components. The Applicant submits that the embodiments of the invention as claimed in Claims 1 and 30 are neither taught nor suggested in Jang et al., even in view of Miyokawa et al.

Jang et al., while providing for determining a direction for adjusting within an elastic range the optical components after the optical components are initially welded, does not provide for determining a direction to plastically deform, nor does Jang et al. provide for determining a direction to plastically deform through performing a sweep of force vectors.

In Jang et al., before the optical components are welded, the gripper initially "moves the ferrule until an optimum power of light transmitted through the fiber is detected." (column 4, lines 63-65). The gripper may then "move the ferrule in the +Y direction a distance X0 which approximates the amount of anticipated shrinkage," which "may be predetermined from

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empirical data." (column 5, lines 1-13). Next, "the initial weld spots attach the ferrule 48 to the sidewalls 58 at a center location 72 of the clip 52." (column 5, lines 14-20). Subsequently, "the optical power P2 of the light transmitted through the fiber after the initial laser weld is detected and stored." (column 5, lines 22-27). "It is desirable to move the ferrule in the elastic region of the ferrule/clip subassembly to prevent permanent deformation. The power of detected light P3 after the fiber cable has been moved X1 is stored." (emphasis added, column 5, lines 31-34). "If P3 is greater than P2 then the laser weld machine will again weld the ferrule and clip at the center location . . . The subsequent welds in the center location are preferably at a location different from the previous center weld spots." (column 5, lines 36-40).

Therefore, Jang et al. discloses determining a direction to adjust optical components within an elastic range, but does not disclose determining a direction to adjust optical components to plastically deform at least one of the optical components. Jang et al. further discloses using laser hammering, but this also adjusts the optical components within an elastic range (column 6, lines 36-60). While Jang et al. does disclose that "[t]he position of the ferrule after a weld may be adjusted mechanically by the gripper" (column 6, lines 64-65) and disclose "a clip 300 which can be mechanically plastically deformed. The plastically deformable clip 300 is more conducive to mechanical adjustment of the fiber ferrule. By way of example, the clip 300 may be plastically deformed by the mechanical gripper shown in FIG. 6" (column 6, line 66 to column 7, line 4), Jang et al. does not disclose or suggest determining a direction to plastically deform at least one of the optical components (e.g., clip) through mechanical means.

Furthermore, although Miyokawa et al. discloses that optical components can be plastically deformed, Miyokawa et al. does not disclose determining a direction to plastically deform.

Moreover, even if Jang et al. and/or Miyokawa et al. had disclosed determining a direction to plastically deform, Jang et al. and Miyokawa et al. together do not disclose determining this direction through performing a sweep of force vectors. Jang et al. discloses "moving the ferrule in a pre-programmed direction a distance X1." (emphasis added, column 5, lines 30-31). If the optical output improves, the ferrule is welded. Thus, while Jang et al.

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discloses a single iterative movement in a particular direction, with a subsequent weld if there is an improvement, the present application, for example, discloses that the sweep through force vectors may occur through 360 degrees, with one degree increments. That is, the ferrule may be moved multiple times, with the direction to plastically deform being determined from the best of these multiple movements. Whereas, in Jang et al., the ferrule is moved and if there is an improvement in the optical output from that movement, the ferrule is welded, presumably regardless of whether another direction would provide greater optical output improvement.

Further, Claim 30 recites, in a relevant portion, "c) determining a direction to plastically deform one of said optical components through performing a sweep of force vectors; d) applying a force having a peak value in the determined direction to plastically deform said one of the optical components to re-align the optical components; e) measuring an optical signal after said plastic deformation; and f) if a predetermined signal strength is not achieved with the optical signal, repeating c) through e) with the force in d) having the same peak value or a different peak value." Miyokawa et al. and Jang et al. together do not teach or suggest, alone or in combination, the limitations of Claim 30.

As such, the references do not teach or suggest, alone or in combination, all of the claim limitations, and therefore Claims 1 and 30 are not unpatentable over Jang et al. in view of Miyokawa et al. Claims 2-19, and 35 are dependent on Claim 1 and therefore include all of the limitations of Claim 1 and addition limitations therein. As such, these claims are believed allowable based upon Claim 1 and for the addition limitations they include therein. Claims 31-32, and 34 are dependent on Claim 30 and therefore include all of the limitations of Claim 30 and addition limitations therein. As such, these claims are believed allowable based upon Claim 30 and for the addition limitations they include therein.

Claim 3 includes, among other limitations, (underlining added for emphasis) "wherein said applying the force in the determined direction comprises: providing a force feedback signal; and controlling an applied force vector using the force feedback signal." The Applicant submits that the embodiments of the invention as claimed in Claim 3 is neither taught nor suggested in Jang et al., even in view of Miyokawa et al.

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Jang et al., while providing for moving the ferrule a predetermined distance X1, does not provide for applying a force vector, nor does Jang et al. provide for applying a force vector using the force feedback signal. Jang et al. discloses in column 5, lines 34-40 moving the ferrule a predetermined distance. However, the distance moved is not a function of a measured or estimated force. In contrast, in one exemplary embodiment as claimed in Claim 3, a force feedback signal is provided, and an applied force vector is controlled using the force feedback signal. Miyokawa et al. also does not overcome the deficiency of Jang et al. to reject claim 3.

As such, the references do not teach or suggest, alone or in combination, all of the claim limitations, and therefore Claim 3 is not unpatentable over Jang et al. in view of Miyokawa et al.

Claims 20-29 Rejected Under §35 U.S.C. §102(e)

The Examiner has rejected Claims 20-29 under 35 U.S.C. §102(e) as allegedly being anticipated by Jang et al. (6,608,959 B2).

The Applicant's amended Claim 20 calls for (underlining added for emphasis) "... the gripper is adapted to perform a sweep of force vectors on at least one of the optical components of the photonic package in an automated manner to determine a direction to plastically deform a supporting member coupled to said at least one of the optical components to re-align the optical components." The Applicant submits that Claim 20 is not anticipated by Jang et al. under 35 U.S.C. §102(e).

As discussed above, Jang et al., while providing for determining a direction for adjusting within an elastic range the optical components after the optical components are initially welded, does not provide for determining a direction to plastically deform, nor does Jang et al. provide for determining a direction to plastically deform through performing a sweep of force vectors. Similarly, Miyokawa et al. does not provide for determining a direction to plastically deform, nor does Miyokawa et al. provide for determining a direction to plastically deform through performing a sweep of force vectors.

Accordingly, the Applicant submits that Claim 20 is not anticipated by Jang et al. under 35 U.S.C. §102(e). Claims 21-29, and 33 are dependent on Claim 20 and therefore include all of

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the limitations of Claim 20 and addition limitations therein. As such, these claims are believed allowable based upon Claim 20 and for the addition limitations they include therein.

New Claims 35-39

Claim 35 is dependent on Claim 1 and therefore includes all of the limitations of Claim 1 and addition limitations therein. As such, this claim is believed allowable based upon Claim 1 and for the addition limitations it includes therein. By way of example, claim 35 recites, "said applying the force comprises determining the force to be applied, and applying the determined force in a controlled manner."

While Jang et al. discloses moving the ferrule by a particular distance in a specific direction (see column 5, lines 29-40, for example), Jang et al. does not disclose determining the force to be applied and applying the determined force in a controlled manner." In the system disclosed by Jang et al., an elastic deformation is achieved through moving the ferrule by a particular distance. Such "brute force" method of deformation does not involve determining the force to be applied nor does it involve applying the determined force in a controlled manner.

Claim 36 is dependent on Claim 3 and therefore includes all of the limitations of Claim 3 and addition limitations therein. As such, this claim is believed allowable based upon Claim 3 and for the addition limitations it includes therein.

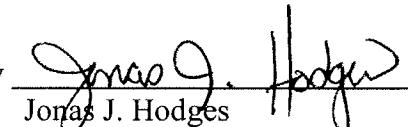
By way of example, claim 36 recites, "the force feedback signal is a function of an actual applied force and an estimated applied force, the actual applied force being applied to the optical components and measured by a force transducer, the estimated applied force being determined by measuring current supplied to a force applying mechanism when applying the force in the determined direction." Jang et al. does not teach or suggest using an actual applied force and an estimated applied force for the alignment of optical components of a photonic package.

Claims 37-39 are dependent on Claim 30 and therefore include all of the limitations of Claim 30 and additional limitations therein. As such, this claim is believed allowable based upon Claim 30 and for the additional limitations it includes therein.

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Therefore, in view of the above amendment and remarks it is submitted that claims 1-36 are patentably distinct over the prior art and that all the rejections to the claims have been overcome. As such, allowance of the above Application is requested. If there are any remaining issues that can be addressed over the telephone, the Examiner is cordially invited to call Applicant's attorney at the number listed below.

Respectfully submitted,
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